
Bird observations from São Tomé: Monte Carmo as a priority conservation site

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Observations d'oiseaux de São Tomé : Monte Carmo comme site de priorité pour la conservation.

A l'occasion d'inventaires effectués sur l'île de São Tomé, dans le Golfe de Guinée, en juillet–août 2007, 46 espèces ont été trouvées, y compris tous les taxons endémiques. L'abondance avienne, basée sur le taux de rencontre, est plus élevée dans les forêts montagnardes que dans les forêts à plus basse altitude, mais ces dernières abritent plus d'espèces. Les zones agricoles supportent une avifaune mixte d'espèces endémiques et introduites. Les espèces les plus abondantes dans les deux habitats forestiers sont quatre espèces endémiques : le Souimanga de Newton *Anabathmis newtoni*, la Prinia de São Tomé *Prinia mollerii*, le Tisserin de São Tomé *Ploceus sanctithomae* et le Serin roux *Serinus rufrobrunneus*. Les forêts de basse altitude de Monte Carmo (Ribeira Peixe) abritent plusieurs Ibis de Bocage *Bostrychia bocagei* dans une zone relativement limitée, ainsi que le Néospize de São Tomé *Serinus (Neospiza) concolor* et la Pie-grièche de São Tomé *Lanius newtoni*. Le Nasique de Bocage *Amaurocichla bocagii* et la pie-grièche ont aussi été observés au dessus de 1.000 m dans la zone d'Ana Chaves. Les forêts de Monte Carmo sont considérées comme une priorité pour des projets de conservation, qui pourraient inclure du tourisme basé sur l'observation des oiseaux, mais leur avenir est incertain à cause des développements récents dans les plantations d'huile de palme avoisinantes.

Summary. Surveys carried out on the Gulf of Guinea island of São Tomé in July–August 2007 found 46 species, including all of the endemic taxa. Bird abundance was higher in montane forests, based on encounter rates, than in forests at lower elevations, but the latter held more species. Agricultural areas supported a mixed avifauna of endemic and introduced species. Numerically dominant species in both forest habitats were the endemic Newton's Sunbird *Anabathmis newtoni*, São Tomé Prinia *Prinia mollerii*, São Tomé Weaver *Ploceus sanctithomae* and Príncipe Seedeater *Serinus rufrobrunneus*. The low-elevation forests of Monte Carmo (Ribeira Peixe) held several Dwarf Olive Ibises *Bostrychia bocagei* in a comparatively small area, as well as São Tomé Grosbeak *Serinus (Neospiza) concolor* and São Tomé Fiscal *Lanius newtoni*. São Tomé Short-tail *Amaurocichla bocagii* and the fiscal were also recorded above 1,000 m in the Ana Chaves area. The forests of Monte Carmo are considered a priority for conservation projects, which might include birding-based tourism, but their future is uncertain because of recent developments in nearby oil-palm plantations.

The islands of São Tomé (857 km²) and Príncipe (139 km²) in the Gulf of Guinea hold at least 17 and eight single-island endemics, respectively, probably representing the largest number of endemic birds per land area for any island group (Melo 2007, Melo & Jones in press). Several of the endemics are of conservation concern, mostly due to habitat loss, including the Vulnerable São Tomé Short-tail *Amaurocichla bocagii* and the Critically Endangered Newton's Fiscal *Lanius newtoni*, São Tomé Grosbeak *Serinus (Neospiza) concolor* and Dwarf Olive Ibis *Bostrychia bocagei* (BirdLife International 2008).

These volcanic islands possess a rugged topography with limited level ground along the coast and in some valleys. São Tomé reaches 2,024 m, whilst on Príncipe the highest elevations peak at 945 m. Fast-running streams radiate down

the mountains through lush forest and cropland to the sea on both islands (Christy & Clarke 1998, Jones & Tye 2006). The islands are covered in lush montane and low-elevation forest, shade forests (cocoa and coffee plantations), derelict plantations (*capoeiras*) and some open savannah (on São Tomé).

The islands were first occupied by humans after their discovery by the Portuguese in the 1470s, and their economy became dependent on cash crops, especially cocoa and coffee, both cultivated under shade trees in large plantations (*roças* or shade forest) (Seibert 2002). The result was that most forest below 1,000–1,200 m was drastically modified, if not destroyed; the least disturbed forest areas at lower elevations are concentrated in the wettest south-western part of São Tomé, and in southern Príncipe. On the other hand, one of

the key habitats on both São Tomé and Príncipe is the shade forest or *capoeira* resulting from the abandonment of former plantations of cocoa, coffee, coconut and oil-palm after independence in 1975 (Christy & Clarke 1998, Jones & Tye 2006).

Data on the local avifauna appeared only after the mid-19th century. Due to the country being closed to most foreigners until the recent past (Seibert 2002), updated information on some of the rarest endemics became available only after the 1980s (Sargeant 1994, Jones & Tye 2006). More recent research has addressed the taxonomy and biogeography of the endemics (Melo 2007, Melo & Jones in press), compared the densities of endemic species in different habitats and human impacts (Dallimer *et al.* 2009) and the distribution and basic ecology of the threatened species (ABS 2007, Maia & Alberto 2009).

São Tomé possesses three Important Birds Areas (IBAs) that encompass the main habitat types (lower elevation and montane forests, and savannahs (Christy 1998). Some sites within the IBAs have been well explored by ornithologists, such as the montane forests of Lagoa Amélia and the nearby *capoeiras* and agricultural mosaic of Bom Sucesso (Rocha 2008, Dallimer *et al.* 2009). However, areas such as the lower elevation forests of Monte Carmo, above Ribeira Peixe, although well known to birders and visited by researchers (Melo 2007, Leventis & Olmos 2009), lacked descriptions of their bird communities.

Here we report the findings of a bird survey on São Tomé during a fact-finding visit to the islands sponsored by BirdLife International and the A. P. Leventis Ornithological Research Institute carried out between 13 July and 12 August 2007, with further on visits in January and July–August 2008.

Study sites and Methods

Observations were made along existing paths in selected localities according to access and bird species expected to be found. Characterisation of the different vegetation types follows Jones & Tye (2006).

Bom Sucesso (00°17'20"N 06°36'45"E; 1,148 m): visited on 19, 23–28 July and 9 August. The site of the national botanical garden and a gateway to the trails leading to Pico de São Tomé, Lagoa Amélia and other locations in the central

massif. A nearby elevation (Macrambalá) is also accessible by vehicle, with a trail starting along the ridge overlooking the Nova Ceilão Valley (walked on 28 July). The gardens cover a small area, with both native and introduced trees, and flowering plants. This area is surrounded by farms cultivating bananas, plantains, carrots and yams, with isolated clumps of trees. Large areas are occupied by invasive grasses and herbs. This part of the island is much cooler and more subject to mist than lower elevations.

Lagoa Amélia (00°16'50"N 06°35'36"E; 1,385 m): visited on 23–24 and 26–27 July. Covering montane forest inside Parque Natural Obô this well-known birding spot is accessed via a track from Bom Sucesso. Within the park's boundary, which is already encroached by farmland, the forest becomes continuous as the track ascends the mountain. Trees may reach over 30–35 m, with a heavy cover of moss and epiphytic plants. Exotic bamboos along the track mark old roads between now derelict *roças*. Lagoa Amélia is an old volcanic crater, now filled by grassy vegetation (no standing water during our visit), surrounded by montane forest.

Monte Carmo (campsite at 00°09'06"N 06°33'60"E; 363 m): visited on 1–4 August. Situated in the south-west of the island near Ribeira Peixe, this is a well-known site for the rarest species on São Tomé (Leventis & Olmos 2009), and is reached after a two-hour walk from the nearby oil-palm plantation of Emolve. Above the plantation the vegetation gradually changes from *capoeira* and shade forest to mature low forest (with many *Symphonia globulifera*) and the trail follows a fairly gentle slope bordered by deep valleys. The ground is commonly strewn with rocks, which probably precluded cultivation. There are many level areas along the slope and water collects in some places. Signs of foraging feral pigs were plentiful. This is one of the wettest parts of the island and it rained throughout our stay, despite this being the 'dry' season.

Sites in São Tomé where only qualitative observations were carried were Roça Bindá (00°13'10"N 06°27'57"E; 30 m) and Roça Juliana de Sousa (00°12'01"N 06°28'20"E; 214 m), both visited on 15 July; Roça Bombaim and Formoso Grande (campsite at 00°13'51"N 06°37'42"E; 631 m), visited on 29–30 July; the well-known trail between Bom Sucesso and Pico de São Tomé,

and from there down to Ponta Figo (see Christy & Clarke 1998), walked on 16–17 July; and the headwaters of the rio Ana Chaves (00°15'45"N 06°34'23"E, 1,182 m), visited on 9 August.

Birds seen or heard were recorded along the trails, including species with far-carrying vocalisations such as orioles and pigeons. Quantitative data were recorded only when it was not raining, accounting for the seemingly low effort at Monte Carmo. Some species were sound-recorded, the relevant files being available at Xeno-canto (XC; www.xeno-canto.org/africa). As a measure of relative abundance we used encounter rates (Bibby *et al.* 1998) expressed by the number of individuals recorded per ten hours (see Table 1 for sampling effort). This index and its variations give a less subjective idea of the relative abundance and detectability of birds present in a given area (Pacheco & Olmos 2005).

We took GPS coordinates of all individual Dwarf Olive Ibises, São Tomé Fiscals, São Tomé Grosbeaks and São Tomé Short-tails detected. As reliable altitude readings could not always be made due to the dense tree cover we use values obtained from GoogleEarth throughout this paper. Nomenclature principally follows Jones & Tye (2006) with the modifications suggested by Melo (2007) and Melo & Jones (in press).

Results and Discussion

All endemic birds known on São Tomé were recorded (Table 1). Overall, 45 species were observed, including one seabird nesting in tree hollows in the forest and one shorebird on the beach. Twenty-five species were found in the agricultural mosaic of Bom Sucesso and the *capoeiras* between Bindá and Juliana de Sousa, both sharing 16 species, whilst 20 were found in the shade plantations and *capoeiras* of Bombaim. The environs of São Tomé town harboured 22 species, including most of the introductions, many of which also occur at Bom Sucesso, but montane and lowland forests support only native species. None of the introduced birds has, to date, colonised the latter habitats despite the long history of European colonisation and trade with mainland Africa (Seibert 2002, Jones & Tye 2006).

Montane forests at Lagoa Amélia, where survey effort was greatest, held 15 species compared to 20 at the lower elevation Monte Carmo, with 12 of

these shared. Species found only in mature or old secondary forest included Dwarf Olive Ibis, São Tomé Short-tail, São Tomé Fiscal and São Tomé Grosbeak, all found at Monte Carmo.

We found no evidence of any endemic species breeding during our survey, and only two (São Tomé Oriole *Oriolus crassirostris* and Newton's Sunbird *Anabathmis newtoni*) consistently responded to playback. São Tomé Prinia *Prinia mollerii* was commonly seen performing aerial displays, but these appear to occur year-round (Christy & Clarke 1998, Jones & Tye 2006). Only Vitelline Masked Weavers *Ploceus velatus* were observed nest building and displaying, but several São Tomé Weavers were observed nest building in the Bom Sucesso area during the July 2008 visit.

A greater richness at Monte Carmo agrees with the findings of Dallimer *et al.* (2009), who compared Lagoa Amélia with another lower elevation site, rio São Miguel, in western São Tomé. The main difference between forest types uncovered by their study and ours was the lack of endemics such as the ibis, fiscal, grosbeak, short-tail and Giant Weaver *Ploceus giganteus* in montane forest. On the other hand, that the ibis, fiscal and short-tail do occur in montane forest some distance from Lagoa Amélia (Rocha 2008; see below) lends credence to the theory that human activities like hunting and gathering of forest products result in lower densities of those species (Dallimer *et al.* 2009).

The point counts undertaken by Rocha (2008) found 15 species in montane forest in the Bom Sucesso / Lagoa Amélia area, although his sampling in less-disturbed areas further from Lagoa Amélia resulted in the addition of Dwarf Olive Ibis and São Tomé Short-tail. The agricultural mosaic of Bom Sucesso yielded only 17 species, compared to 25 in our list, a difference probably the result of recce walks being a more effective method of recording uncommon species.

As noted by other observers (Christy & Clarke 1998, Jones & Tye 2006) most endemic birds utilise shade plantations and agricultural areas with a mosaic of cultivation, sparse trees and hedges, which finding has since been corroborated by more detailed research (Rocha 2008). These habitats possess abundant introduced plants providing nectar (the shade tree *Erythrina poeppigiana* and the shrub *Tithonia diversifolia*)

and fruit (the trees *Cecropia peltata* and *Musanga cecropioides* plus several cultivated species; the shrub *Cestrum levigatum*) consumed by many endemics (Leventis & Olmos 2009). Species such as Príncipe Seedeater *Serinus rufobrunneus*, São Tomé Flycatcher *Tersiphone atrochalybeia*, São Tomé Thrush *Turdus olivaceus*, São Tomé Chestnut-winged Starling *Onychognathus f. fulgidus*, Newton's Sunbird and the globally threatened São Tomé White-eye *Zosterops (ficedulinus) feae* had their highest encounter rates in the Bom Sucesso mosaic compared to nearby forest, although this result masks differences among discreet habitats (annual cultivation, tree clumps, banana groves, etc.) comprising the mosaic.

Birds, as a whole, were commonest in Lagoa Amélia compared to Monte Carmo, with encounter rates of 540 birds / 10 hours at the first compared to 170 at the latter. Limited sampling effort and almost constant rain during our stay at Monte Carmo were factors, but the lower abundance of birds observed was striking, especially of common species such as prinias, speirops and Newton's Sunbird (Table 1).

The commonest endemics (Príncipe Seedeater, Newton's Sunbird, São Tomé Speirops *Zosterops lugubris* and São Tomé Weaver) were also the most abundant species in both montane and lower elevation forest, but with striking differences in relative abundances. Overall, Monte Carmo had lower encounter rates for most endemics, and the white-eye was absent. Only the flycatcher, starling and speirops had encounter rates that could be considered similar.

King & Dallimer (2003) and Dallimer *et al.* (2009), using mist-netting and point counts, also found striking differences between montane and lowland forests in the relative abundances of São Tomean endemics, with montane forest holding greater numbers of seedeaters, prinias, speirops, São Tomé Weaver and Newton's Sunbird. In contrast, orioles, paradise flycatchers, thrushes and Giant Sunbird are commonest at lower elevations. Data from encounter rates broadly agree with this pattern.

Significant records

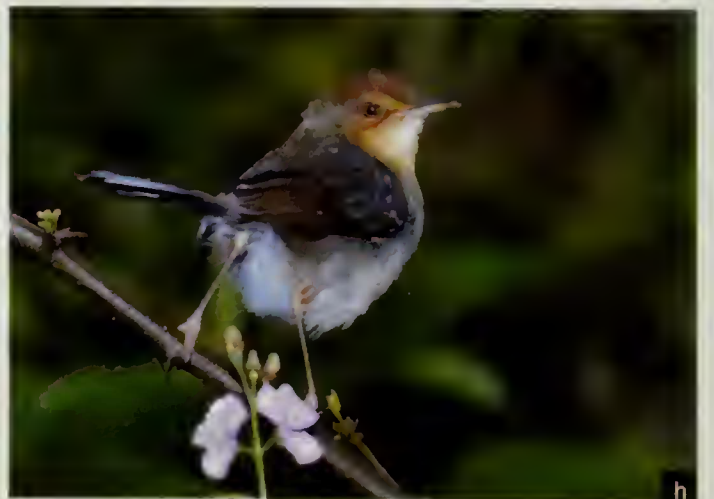
Dwarf Olive Ibis *Bostrychia bocagei* This species was recorded only at Monte Carmo, a known site for the species together with the Ió Grande River

and hillsides in the Formoso Grande area (ABS 2007, Leventis & Olmos 2009). What sounded like a call was heard briefly at a distance in Formoso Grande. Although considered silent compared to other *Bostrychia* ibises (Christy & Clarke 1998, Jones & Tye 2006), on 1 August three birds were heard calling from different perches at dusk and one called at dawn on 2 August. The voice (XC 18130) is, however, similar to related species.

Despite being used by hunters, Monte Carmo harbours an important ibis population. On 1 August we recorded the first ibis near the campsite, perched *c.* 8 m above ground. On 2 August, at 06.18 hrs, one was seen perched in the lower canopy at 00°09'02.8"N 06°34'05.1"E (321 m), with another nearby at 10.00 hrs. On 3 August we found eight birds during the morning (07.10–11.20 hrs) while walking from 00°08'52.1"N 06°34'14.7"E (303 m) to 00°09'13.2"N 06°33'52.9"E (386 m). These included four lone birds and two 'pairs', one of the latter comprising an adult and a juvenile (which had a shorter bill and drabber plumage). All of these birds, except one of the lone individuals, were foraging on the ground when first seen, with one bird perched on a tree. Additionally, on 4 August another pair was found at 00°08'55.6"N 06°34'32.6"E (*c.* 284 m) in a tree-fall gap in second-growth forest with little leaf litter and much exposed soil.

Sightings were at least 150 m apart (the latter much further), but we can not discount the possibility of double-counting, although we tried to track the direction birds flew or if they remained perched when we lost contact with them. The clumped records show an extraordinary gathering of those rare, apparently solitary birds, in a small area.

The ibises foraged alone or in loose family groups, and were quite silent by day, calling only at dusk and dawn, if at all. All were in mature or old second-growth forest at 150–400 m with well-spaced large trees, very open undergrowth and large patches of exposed soil resulting from feral pig activity or rainwater. In some areas, the soil was largely covered by irregularly shaped rocks, which also results in an open understory. The association between ibises and disturbed soil or open understory has been mentioned previously (Jones & Tye 2006).



São Tomé Maroon Pigeon *Columba thomensis*

Two adults perched on a jackfruit tree at Juliana de Sousa, with another in montane forest at Pico Carvalho (00°16'12"N 06°34'35"E; 1,595 m) on 18 July, and one in the same spot on 9 August feeding on the fruit of *Schefflera manii*. Another adult seen at 00°17'04"N 06°33'25"E (1,165 m) on 20 July completes our records of this uncommon species. The record at Juliana de Sousa (214 m) reveals that the species is not strictly associated with montane forest and can utilise *capoeira* at low elevations, at least seasonally.

Dallimer *et al.* (2009) found this species is not a montane specialist as has sometimes been suggested (Jones & Tye 2006), with significant populations present in the lowlands of western São Tomé, where Juliana de Sousa is sited. On the other hand, it was not found at Monte Carmo during our survey (although one was seen in January 2008), suggesting its occurrence in the lowlands might be patchy or seasonal.

São Tomé Short-tail *Amaurocichla bocagei*

Although Jones & Tye (2006) set the altitudinal limit for this species at 500 m, Dallimer *et al.* (2003) found one at 1,100 m in the island's central massif, the same general area where the species was found breeding by Rocha (2008). Maia & Alberto (2009) found short-tails to be regular dwellers in montane forests above 1,300 m, and fairly common in some areas.

Our records support those findings. We located the species near Formoso Grande, where a pair was seen repeatedly on 29–30 July at 00°13'50.6"N 06°37'44.4"E (622 m) in a gully cut by a stream running among boulders in low forest. More interestingly, on 9 August we also found short-tails along the slope of the Ana Chaves Valley, where

a pair was seen at 00°15'45.4"N 06°34'23.7"E (1,174 m), and a lone individual at 00°15'36"N 06°34'25"E (1,162 m), all in steep terrain covered by transitional montane-low forest, and away from water. As noted by Maia & Alberto (2009), this suggests that potential habitat for the species is more extensive than had been assumed.

The species was also found at the well-known area of Monte Carmo. A pair was seen at 00°09'09"N 06°34'14.8"E, *c.*230 m, and a lone bird at the campsite, both on 1 August. Next day, a trio, a pair and a single individual were recorded while walking the area of more level ground between the campsite and 00°09'14.4"N 06°32'04.3"E, a transect of *c.*4 km. On 3 August a pair was seen on the ground at 00°09'13.2"N 06°33'52.9"E in an area where the undergrowth was open with many rocks on the forest floor, which appears washed by rain, with little litter. Another bird was observed in the lower strata (3–4 m high) on more level ground at 00°09'13.2"N 06°33'52.9"E (386 m), at least 100 m from a wet gully. One bird was also seen nearby the following morning.

In the very humid forests of Monte Carmo only one pair was closely associated with water, foraging near the ground by a drainage line with a trickle of water. The others were seen on the forest floor and lower strata of the forest. In montane forests, Maia & Alberto (2009) also found short-tails were not particularly associated with water, unlike as previously suggested (Atkinson *et al.* 1991), and this finding was corroborated for lower elevation forest by Dallimer *et al.* (2009).

São Tomé Fiscal *Lanius newtoni* Restricted to few sites in the south-east and south-west of São Tomé (those areas of highest rainfall), from the Bombaim / Formoso area south-west through the Ió Grande Valley (Schollaert & Willem 2001), the Martim Mendes basin above Ribeira Peixe and west to the Xufexufe basin (King & Dallimer 2003) to *c.*1,300 m (Maia & Alberto 2009). On 3 August, one was observed low down in a narrow forested gully at Monte Carmo (00°09'12.7"N 06°33'48.9"E; 400 m).

Our excursion to Ana Chaves, south-west of the Bombaim / Formoso area and within the headwaters of the Ió Grande, had the specific goal of finding this species. The site lies in a deep valley with steep slopes. As we descended we heard

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Figure 1. (a) São Tomé Scops Owl / Petit-duc de São Tomé *Otus hartlaubi*; (b) São Tomé Green Pigeon / Colombar de São Tomé *Treron sanctithomae*; (c) São Tomé Short-tail / Nasique de Bocage *Amaurocichla bocagei*; (d) São Tomé Thrush / Merle de São Tomé *Turdus olivaceofuscus*; (e) Juvenile São Tomé Oriole / Lorient de São Tomé *Oriolus crassirostris*; (f) Male São Tomé Oriole / Lorient de São Tomé *Oriolus crassirostris*; (g) Male São Tomé Paradise Flycatcher / Tchitrec de São Tomé *Tersiphone atrochalybeia*; (h) São Tomé Prinia / Prinia de São Tomé *Prinia mollerii* (Fábio Olmos, except (c) A. P. Leventis)

Table 1. Bird species recorded during this survey. Numbers indicate the number of individuals detected per ten hours of all-records censuses, whilst x indicates species recorded outside census periods.

Tableau 1. Espèces d'oiseaux observées pendant l'inventaire. Les chiffres indiquent le nombre d'individus détecté par dix heures de recensement, tandis que x indique les espèces observées en dehors des périodes de recensement.

- A: Farms around Bom Sucesso, including tree clumps and small remnant forest patches amid cultivated areas. Census effort: 5.5 hours.
 B: Montane forest near Bom Sucesso, mostly along the trail to Lagoa Amélia and to Novo Ceilão. Census effort: 14.15 hours.
 C: Low forest around the Monte Carmo campsite. Census effort: 7.8 hours.
 D: Trail through shade forest and *capoeira* (old coconut and cocoa plantations) between roças Bindá and Juliana de Souza. Census effort: only qualitative observations.
 E: Trek through montane forest from Bom Sucesso up Pico de São Tomé and down to shade forest above Ponta Figo. Census effort: only qualitative observations.
 F: Tall shade forest near Roça Bombaim. Census effort: qualitative observations.
 G: Gardens, orchards, vacant lots, urban areas and the airport environs around São Tomé town. Census effort: only qualitative observations.

- A : Zones cultivées autour de Bom Sucesso, y compris des fourrés et des lambeaux de forêt au milieu de cultivations. Effort de recensement : 5,5 heures.
 B : Forêt montagnarde près de Bom Sucesso, principalement le long du sentier vers Lagoa Amélia et Novo Ceilão. Effort de recensement : 14,15 heures.
 C : Forêt de basse altitude autour du camp à Monte Carmo. Effort de recensement : 7,8 heures.
 D : Sentier à travers de la forêt ombrophile et de *capoeira* (vieilles plantations de cocotiers et de cacao) entre roças Bindá et Juliana de Souza. Effort de recensement : uniquement des observations non systématiques.
 E : Trajet à travers de la forêt montagnarde de Bom Sucesso à Pico de São Tomé et, à la descente, traversant la forêt ombrophile au dessus de Ponta Figo. Effort de recensement : observations non systématiques.
 F : Forêt ombrophile près de Roça Bombaim. Effort de recensement : observations non systématiques.
 G : Jardins, vergers, terrains vagues, zones urbaines et environs de l'aéroport autour de la ville de São Tomé. Effort de recensement : observations non systématiques.

Common name	Scientific name	A	B	C	D	E	F	G
White-tailed Tropicbird	<i>Phaethon lepturus</i>			x	x			
Cattle Egret	<i>Bubulcus ibis</i>	12.5			x		x	
Green-backed Heron	<i>Butorides striata</i>				x		x	
Western Reef Heron	<i>Egretta gularis</i>				x			
Dwarf Olive Ibis	<i>Bostrychia bocagei</i>			11.5				
Yellow-billed Kite	<i>Milvus (migrans) parasitus</i>				x			x
Red-necked Spurfowl	<i>Francolinus afer</i>	x						
Common Sandpiper	<i>Actitis hypoleucos</i>							x
São Tomé Green Pigeon	<i>Treron sanctithomae</i>	1.8	10.6	2.6	x	x	x	
São Tomé Bronze-naped Pigeon	<i>Columba malherbii</i>	3.6	2.1					
São Tomé Lemon Dove	<i>Columba larvata simplex</i>	16.1	26.1	2.6	x	x	x	
São Tomé Maroon Pigeon	<i>Columba thomensis</i>				x	x		
Feral Pigeon	<i>Columba livia</i>	x						x
Laughing Dove	<i>Streptopelia senegalensis</i>	1.8			x		x	x
Red-headed Lovebird	<i>Agapornis pullarius</i>				x			x
Emerald Cuckoo	<i>Chrysococcyx cupreus insularum</i>	1.8			x		x	
Barn Owl	<i>Tyto alba thomensis</i>	x						x
São Tomé Scops Owl	<i>Otus hartlaubi</i>			x	x	x		
São Tomé Spinetail	<i>Zoonavena thomensis</i>	69.6	4.9		x	x	x	
Palm Swift	<i>Cypsiurus parvus</i>	12.5			x		x	x
Common Swift	<i>Apus cf. apus</i>							x
Little Swift	<i>Apus affinis bannermani</i>	8.9			x		x	x
São Tomé Kingfisher	<i>Alcedo (cristata) thomensis</i>				x		x	
São Tomé Thrush	<i>Turdus olivaceofuscus</i>	16.1	9.2	1.3	x	x	x	x
São Tomé Prinia	<i>Prinia mollerii</i>	35.7	42.4	12.8	x	x	x	x
São Tomé Short-tail	<i>Amaurocichla bocagii</i>			7.7				
São Tomé Paradise Flycatcher	<i>Tersiphone atrochalybeia</i>	26.8	14.1	15.3	x		x	
Newton's Sunbird	<i>Anabathmis newtoni</i>	128.6	84.1	20.4	x	x	x	x

Common name	Scientific name	A	B	C	D	E	F	G
Giant Sunbird	<i>Dreptes thomensis</i>		3.5	1.3		x	x	
São Tomé White-eye	<i>Zosterops (ficedulinus) feae</i>	50.0	17.0			x		
São Tomé Speirops	<i>Zosterops lugubris</i>	117.9	114.5	17.9	x	x	x	
São Tomé Fiscal	<i>Lanius newtoni</i>			x				
São Tomé Oriole	<i>Oriolus crassirostris</i>	12.5	21.2	14.0		x		
São Tomé Chestnut-winged Starling	<i>Onychognathus f. fulgidus</i>	17.9	2.8	2.6	x	x	x	x
Vitelline Masked Weaver	<i>Ploceus velatus peixotoi</i>	35.7		1.3		x		x
Giant Weaver	<i>Ploceus grandis</i>			x	x	x		
São Tomé Weaver	<i>Ploceus sanctithomae</i>	30.4	84.8	25.5	x		x	x
Fire-crowned Bishop	<i>Euplectes hordeaceus</i>							x
Common Waxbill	<i>Estrilda astrild</i>	282.1					x	x
Southern Cordon-bleu	<i>Uraeginthus angolensis</i>							x
Bronze Mannikin	<i>Lonchura cucullata</i>	50.0						x
Pin-tailed Whydah	<i>Vidua macroura</i>							x
Yellow-fronted Canary	<i>Serinus mozambicus</i>							x
Príncipe Seedeater	<i>Serinus rufobrunneus thomensis</i>	123.2	102.5	33.2	x		x	x
São Tomé Grosbeak	<i>Serinus (Neospiza) concolor</i>			x				

a bird calling at 00°15'45.4"N 06°34'23.7"E (1,174 m). More were heard when we reached the bottom at 00°15'39.4"N 06°34'33.9"E (1,065 m) and playback during the next three hours elicited vocal response, although no birds approached the source. At least three were heard together along the creek running along the valley, one of them <20 m away.

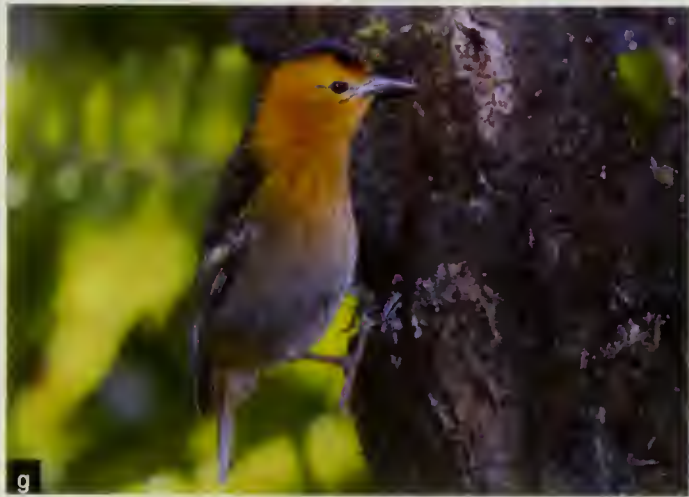
Together with information in the literature our records suggest an association between this species and watercourses, or at least to more open areas in forest, like gullies and riversides, created by water. That could mean that fiscal habitat is more linear, or patchy, than currently believed.

São Tomé Grosbeak *Serinus (Neospiza) concolor*
Positively recorded only from lower altitude forest in the south-west of the island (Jones & Tye 2006), although there is one record from the Monte Café area, near Bom Sucesso (Simpson 2002). In the Monte Carmo area (at 00°09'12.4"N 06°33'55.3"E; 370 m), we heard a song identified as a grosbeak (XC17889) on 4 August at 07.50 hrs. The bird responded but did not approach after playback, moving to a nearby gully, where two individuals were seen in the canopy and lower understorey. The same recording was successfully used to attract a pair in the Monte Carmo area in January 2008.

Conservation issues

Recent conservation initiatives in the country have been linked mostly to ECOFAC (Central Africa Forest Ecosystem Programme), the largely French-funded project that aims to conserve West African forests. Starting in 1992, this resulted in the establishment of the 295 km² Obô Natural Park, covering the most mountainous and least accessible parts of both São Tomé and Príncipe (c.30% of the country), and other related initiatives. Although all land belongs to the government (a legacy of the previous socialist regime), the park's status is still fragile, the law creating it being issued only in 2006. The zoning and management plan of the park were being prepared in 2008, when the first directors were appointed, but the park still lacks sufficient personnel and means to enforce the law. Agricultural encroachment is evident in more accessible parts of the park such as Bom Sucesso, whilst hunting is widespread.

With an only recent opening for free enterprises (Seibert 2002), cocoa, coffee and oil palm exports from São Tomé are to date limited. Much of the economy is at subsistence level; small-scale farming is widespread and extractive activities such as the harvesting of palm-wine and hunting of pigeons, introduced monkeys and pigs are locally important (Carvalho 2008). These occur wherever forest can be accessed. During our stay, large numbers of



people were harvesting palm-wine and hunting in the Formoso Grande / Bombaim area, which was crisscrossed by heavily used trails (some to the point of eroding) and some shelters had been built even inside the park. The same was true of the Bruné area, adjacent to Juliana de Sousa and also part of the Obô park.

Hunting is a widespread, unregulated and socially accepted activity (Carvalho 2008), and hunters were met frequently in the Obô park, including within the environs of Lagoa Amélia and the trail to Pico de São Tomé. Although subsistence hunters prefer feral pigs and Mona Monkeys *Cercopithecus mona*, larger birds like Dwarf Olive Ibises and pigeons are also taken. Also, several commercial hunters harvest pigeons using airguns to supply urban consumers. On most of the trails small piles of feathers (mostly from São Tomé Green and Bronze-naped Pigeons but, at Juliana de Sousa, also São Tomé Pigeons) and spent shotgun cartridges were easily found.

The abundance of harvested and threatened species on both Príncipe and São Tomé is negatively correlated with distance from roads and trails (Dallimer & King 2007, Dallimer *et al.* 2009). The effect of hunting on species such as the ibis is obvious and might explain the species' absence from Lagoa Amélia, but more subtle effects from the presence of people must affect species that are not directly exploited, for example the fiscal, short-tail and grosbeak.

Monte Carmo harbours all of the threatened endemics, including surprising numbers of ibises. The area (sometimes called Ribeira Peixe) has been considered a priority site for conservation action by the BirdLife International partnership. BirdLife has supported the establishment and staff

training of a local NGO, Associação dos Biólogos Sãotomenses (ABS) as a country partner, whilst ABS has already undertaken a broad survey of ibis distribution (ABS 2007) and has commenced monitoring all of the Critically Endangered species at Monte Carmo by employing field assistants from the local community. Further activities are planned to promote the conservation of the area, part of the buffer zone of the Obô park, including awareness campaigns targeting local people.

Monte Carmo is probably the most accessible site where all of the threatened endemics can be found and is already a well-known destination for birders. An international workshop to promote ecotourism in São Tomé and Príncipe held in February 2008 listed birding as an activity to be encouraged and specifically mentioned Monte Carmo as a site for a pilot project. In July 2009 ABS promoted a short course for training bird guides to work in Monte Carmo and it is hoped that this initiative will bear fruit and be supported by the birdwatching community.

However, Monte Carmo faces pressure from neighbouring communities. The lowlands adjoining the forested slopes are occupied by the old oil-palm plantations of EMOLVE. Once the main supplier of cooking oil for the country prior to independence, the plantations subsequently entered a period of decline, with only limited renovation since. The plantations are home to some 500 people, who lack access to electricity or treated water. The oil-processing plant currently employs just 30 persons, half of them on a part-time basis, down from some 400 a few decades ago. The result is that large numbers of people are engaged in palm-wine harvesting, hunting and other extractive activities, signs of which are evident in the core of Monte Carmo.

São Tomé and Príncipe faces daunting problems associated with poverty and an increasing population, now estimated at *c.*156,000 people, etching a living in a very limited land area (Leventis & Olmos 2009, Dallimer *et al.* 2009). The post-independence regime oversaw the collapse of most of the commercial plantations that the economy was reliant upon, and a move to food crops for the local market and extractive activities. This is now changing as the current government seeks to restore the country's agricultural potential, with direct impacts at Monte Carmo.

Legend to figure on opposite page

Figure 2. (a) Newton's Sunbird / Souimanga de Newton *Anabathmis newtoni*; (b) Giant Sunbird / Souimanga de São Tomé *Dreptes thomensis*; (c) São Tomé White-eye / Zostérops becfigue *Zosterops (ficedulinus) feae*; (d) São Tomé Speirops / Zostérops de São Tomé *Zosterops lugubris*; (e) São Tomé Chestnut-winged Starling / Rufipenne de forêt *Onychognathus fulgidus fulgidus*; (f) São Tomé Seedeater / Serin roux *Serinus rufobrunneus thomensis*; (g) São Tomé Weaver / Tisserin de São Tomé *Ploceus sanctithomae*; (h) Male Giant Weaver / Tisserin géant *Ploceus grandis* (Fábio Olmos)

In June 2009 the plantations were ceded by the government (which owns all land in the country) to the French-Belgian-Luxembourg Socfinal company, which owns oil-palm plantations in Africa and Indonesia. According to the local press, Socfinal plans to restore c.2,000 ha of plantations on the south coast of São Tomé, which could either result in greater local employment and fewer people engaged in hunting and other damaging activities, or more people moving to the area being attracted by possible jobs, with more substantial impacts on the forest and its threatened birds. The outcome will largely depend on policies adopted by the plantation's managers.

Also in mid 2009, a similar concession to a Libyan group was announced for the Monte Café plantation, near Bom Sucesso and site of an undocumented grosbeak sighting (Simpson 2002). As the business environment in the country improves and investors' interest increases, it is probable that more initiatives of this nature will appear, almost certainly resulting in *capoeiras* being turned into plantations and potentially resulting in increasing pressure on natural areas if expansion is deemed profitable. A real threat is that small-scale producers of food crops will be dislodged, with further encroachment into the park resulting, as is already occurring in the Bom Sucesso area.

The sustainability of conservation initiatives in São Tomé and Príncipe is a real issue. The country still lacks a critical mass of trained conservation professionals and NGOs rely entirely on external support. Furthermore, it is uncertain if projects such as ECOFAC will leave an enduring legacy when funding is removed. On the other hand, new actors are forcing changes that, for good or worse, will affect the country's endemic and threatened species. The outcome remains uncertain.

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Peter Jones and Will Cresswell made important suggestions on an earlier draft of his paper. Our work would have been impossible without the support of the A. P. Leventis Conservation Foundation. Nigel Collar proffered continuous encouragement and helped unravel many problems. Bastien Loloum 'navigated' us through many local issues in São Tomé and Príncipe. We also acknowledge with gratitude the assistance of Faustino Oliveira, Alzira Rodrigues, Luiz Mario Almeida, Antonio Alberto, Pedro Leitão and all those

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Corrigenda

Bull. ABC 16 (1)

In the report of the Moroccan Rare Birds Committee, the captions for Figs. 6 and 7 on p. 34 should be reversed.

In Salewski *et al.*'s paper on the search for the winter quarters of the Aquatic Warbler *Acrocephalus paludicola*, the person holding the Aquatic Warbler in Fig. 3 on p. 63 is Indega Bindia, not Ibrahima Gueye.

Bull. ABC 16 (2)

In the reportage concerning the Djibouti Francolin *Francolinus ochropectus* survey, on p. 138, the area of potentially suitable habitat in the Mablá Mts. should have read 4.3 km².

In Louette & Hasson's paper on the rediscovery of the Lake Lufira Weaver *Ploceus ruwetii*, the reference 'Craig 2004' on p. 169 should be replaced by 'Oschadleus

2004a', and on p. 172 by 'Oschadleus 2004b'. In the reference list, the entry 'Craig, A. J. F. K. 2004. *Ploceus ruwetii*. In Fry, C. H. & Keith, S. (eds.) *The Birds of Africa*. Vol. 7. London, UK: Christopher Helm' should thus be replaced by:

Oschadleus, D. 2004a. *Ploceus ruwetii*. In Fry, C. H. & Keith, S. (eds.) *The Birds of Africa*. Vol. 7. London, UK: Christopher Helm.

Oschadleus, D. 2004b. *Ploceus velatus*. In Fry, C. H. & Keith, S. (eds.) *The Birds of Africa*. Vol. 7. London, UK: Christopher Helm.

The lark shown in Recent Reports on p. 234, Fig. 2, is not Friedmann's Lark *Mirafrapa pulpa*, but Foxy Lark *M. alopex*. The Kenya record of Friedmann's Lark of 17 May 2009, mentioned on p. 232, is thus also erroneous. See the Photospot in this issue for a discussion of the identification features of both species.